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ABSTRACT

An investigation of college students' belief structures underlying their support or non-support of a nuclear freeze revealed a three-dimensional structure for beliefs in the areas of nuclear weapons and national defense. A questionnaire containing 25 belief statements concerning national defense and nuclear weapons and 4 media use questions was administered to 112 students. Participants, both graduate and undergraduate students, checked one of five responses on a scale ranging from "strongly agree" to "strongly disagree." Approximately 74 percent supported a nuclear freeze. A three-dimensional chart was constructed showing locations of supporters and non-supporters of seven policy statements on the questionnaire. Two distinct clusters emerged. One group favored a strong defense, believed in survival after a nuclear war, and believed that nuclear war is not imminent. The second group favored a strong defense, believed that a nuclear war is not survivable, and believed that nuclear war is imminent. However, positions did not differ so much on the imminence dimension as on the defense and survival dimensions, suggesting that an appeal to the imminence of nuclear war is not effective either for supporters or opposers of the freeze. The questionnaire, data tables, and charts are included. (KC)

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Belief Structures of Students For and Against the Nuclear Freeze

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Abstract

This study investigated the belief structures of college students underlying their support or non-support for the nuclear freeze. The study focused on students as a group that is likely to have some influence on the nuclear debate, either at the present time through demonstrations and other means of voicing their opinions, or, later, in leadership roles. Questionnaires containing 25 belief statements in the area of nuclear weapons and national defense were given to 112 students who were asked to respond to each statement with a five-point Likert-type scale. Factor analysis indicated three dimensions of beliefs were important -- whether or not a strong national defense is necessary, whether or not humanity can survive a nuclear war, and whether or not a nuclear war is imminent.

Belief Structures of Students

For and Against the Nuclear Freeze

The year 1982 saw an outpouring of articles and books pointing out the dangers of nuclear war. These included Jonathan Schell's three-part series "The Fate of the Earth" in The New Yorker, his book by the same title published by Knopf, Ground Zero's Nuclear War: What's In It For You?, and Edward Kennedy and Mark Hatfield's Freeze! How You Can Help Prevent Nuclear War. During the same period, there was a burst of public interest in the issue. One million Americans in 600 cities and towns participated in Ground Zero Week, April 18-25. On June 12, a mass of 700,000 people participated in an anti-nuclear rally in Central Park in New York that may have been the largest political demonstration in U.S. history. A poll by The New York Times and CBS News released on June 13 reported that 72 percent of the public was in favor of a nuclear freeze.

These developments did not take place without opposition. Harper's published an article criticizing the emotionalism of Schell's writings (Kinsley, 1982). An editorial in The New Republic (Krauthammer, 1982) and an article in The New York Review of Books (Draper, 1982) opposed the nuclear freeze. Reader's Digest published several articles criticizing the anti-nuclear weapons movement (Chapple, 1982; Griffith, 1982),

and in October published a book-length feature linking the freeze movement to the KGB in the Soviet Union (Barron, 1982). This linkage became a theme of Sen. Jeremiah Denton, a Republican from Alabama, and was also echoed by President Reagan. Letters to the editor of many newspapers also indicated a sharp division of opinion on the nuclear weapons issue.

By the year 1982, more than 35 years into the nuclear age, most adults, and even many children (Mack, 1981), were aware of the serious consequences of nuclear war. How can people holding the same information hold such directly opposite opinions? Are the two sides picking out different issues as being important, as people appear to do in the nuclear power area and some other areas of controversy? In general, what are the belief structures of persons on opposite sides of the nuclear freeze question? As Fischhoff, Slovic and Lichtenstein have said in relation to public perceptions of a different issue, nuclear power, "A precondition for understanding other people's beliefs is understanding their conceptual universe" (1982, p. 249).

This study was designed to shed some light on these general questions by investigating the belief structures of persons supporting different policy options in the area of nuclear weapons and national defense. A particular purpose was to determine whether there are more than one dimension underlying attitudes for and against the nuclear freeze. The study focused on students as a group that is likely to have some influence on the nuclear debate, either at the present time through demonstrations and other means

of voicing their opinions, or, later, in leadership roles.

The study focused on the following research questions:

1. What are the major dimensions of beliefs in the area of nuclear weapons and national defense?

2. Where do nuclear freeze advocates and opponents fall on these dimensions? Are they located at significantly different points?

Related Studies

Researchers in several other areas of public debate have attempted to define the "cognitive maps" or "belief structures" of persons with different attitudes. Often these studies have used factor analysis to identify the important dimensions of beliefs operating in a particular area. Frequently these studies have shown that a group taking one attitude position will consider one dimension important and that a group taking the opposite position will consider a different dimension to be important.

In one such study, Otway, Maurer and Thomas (1978) looked at the component beliefs that went into making up the attitudes of persons in favor of nuclear power and opposed to nuclear power. They conducted a factor analysis of 39 belief items, and found four factors. There was a psychological risk factor, with one of its items stating that the use of nuclear power will "mean exposing myself to risks which I cannot control." There was an economic and technological benefit factor, with one of its items stating that the use of nuclear power will "increase my country's economic development." There was a sociopolitical risk factor, with one of its items stating that the use of nuclear power will "lead to rigorous physical security measures." And there was an environ-

mental and physical risk factor, with one of its items stating that the use of nuclear power will "lead to air pollution."

These authors found that people perceived risks and benefits in the nuclear power area independently rather than as lying along a single dimension. This is contrary to the general notion of cost-benefit analysis, which usually places costs and benefits on the same dimension. They found that the attitudes of the group "for" nuclear power were influenced by beliefs about technical and economic benefits and environmental risks, while the "against" group's attitudes were influenced by beliefs about psychological and sociopolitical risks.

Results of a content analysis of German newspaper articles dealing with sites where controversial nuclear power plants were being planned found a similar result: "Reports on supporters of nuclear energy consistently stress the need for energy, whilst the opponents' messages relate to the dangers and risks" (Greer-Wooten, 1980, p. 87).

In a study of attitudes toward policies in the Korean War, Modigliani (1972) found that a single "hawk-dove" continuum was not sufficient to describe attitudes. He factor analyzed a set of belief statements and found two dimensions -- international interventionism (agreeing or disagreeing that the United States has a duty to intervene around the world) and administration distrust (agreeing or disagreeing that the Truman administration wasn't doing enough).

Similarly, in a study of the Iranian crisis, Sigelman and

Conover (1982) found that support for conciliatory opinions such as returning the Shah to Iran was best seen as being on a separate dimension instead of being on the opposite end of the same dimension as aggressive policies such as sending in troops.

These studies of beliefs in the areas of nuclear energy and American foreign policy suggest that one dimension may not be adequate to describe people's beliefs, and that persons with pro and con attitudes will often attach importance to different dimensions. The same may be true in the area of attitudes concerning nuclear weapons and national defense.

One dimension that might be important in the area of nuclear weapons and defense has been suggested by Mack (1981). Rather than "hawks" and "doves" or "liberals" and "conservatives," Mack has recommended the categories of "thinkables" and "unthinkables." The distinction between the two is made this way: the unthinkables include "those who believe that a nuclear war, once begun, is likely to create a disaster of such magnitude that it is not meaningful to plan in terms of its actual occurrence" (p. 28). The thinkables "believe that one should plan in terms of nuclear war actually occurring, and even for its aftermath" (p. 28).

Method

This study examined the beliefs about nuclear weapons and national defense of a group of students at the University of Texas at Austin.

A questionnaire was prepared consisting of 25 belief state-

ments concerning national defense and nuclear weapons, four media use questions, and a question about the respondent's sex. The belief statements were selected from material circulating in the nuclear weapons debate of 1982. An effort was made to include statements representing as many different views as possible. Sources included books, magazine articles, newspaper articles, fund solicitation letters, letters to the editors of newspapers, and a program on local public access television in which citizens were interviewed about nuclear weapons. Seven of the items were statements of particular policies being advocated, including the nuclear freeze propposition (included in two slightly different forms), the Jackson-Warner alternative to the freeze, the "no first use" position advocated by former Secretary of Defense Robert S. McNamara, the plan for an initial reduction of 5 percent by the United States advocated by Soviet expert George Kennan, and two statements proposing unilateral disarmament by the United States.

Respondents could check any one of five responses to each statement: "strongly agree," "agree," "neutral," "disagree," and "strongly disagree."

The questionnaire was administered to 14 students in an undergraduate newswriting class, 34 students in an undergraduate news editing class, 52 students in an undergraduate communication theory class and 12 students in a graduate class in research methods.

The questionnaire was administered in classes during the week before a citywide unofficial referendum on the nuclear freeze.

This vote took place at separate voting tables set up in each precinct during an official bond election. Each respondent to the questionnaire was instructed to put a three-letter identifier on the questionnaire that only he or she would know. After the election, respondents were given another brief questionnaire in which they were asked whether or not they had voted on the freeze, and, if so, how. They were told to place the same identifier on this questionnaire that they had used on the first questionnaire. This allowed the two questionnaires to be matched without revealing the respondent's identity.

Only 9 percent of the students surveyed voted in the freeze referendum, and none of them voted against it. The low student turnout was largely due to the fact that most students were not registered to vote in Austin, and a person had to be a registered voter to vote in the freeze election. Because there were no respondents in the sample who voted against the freeze, it was not possible to compare persons who voted for and against the freeze in their positions on the dimensions from the factor analysis. Instead, another analysis strategy was used. Before the factor analysis was done, the seven statements reflecting specific policy options were taken out of the set of 25 statements. Two of these represented different wordings of the freeze proposition. A factor analysis was performed on the 18 statements left when the seven specific policy options were taken out. Then the two freeze statements were used as indicators of respondents' support for or opposition to the freeze.

Pearson product moment correlations between the 18 belief statements were computed for the 112 cases. These correlation coefficients were then used in a principal factor analysis with iteration and varimax rotation. The criterion for determining the number of factors was to retain those with eigenvalues greater than one (Child, 1970). Statements were interpreted as having a significant loading on a factor when the loading was .40 or greater.

Factor scores were computed for each of the 112 cases for all factors that were retained. For each factor or dimension, mean factor scores were compared for the various categories of agreement or disagreement with the idea of a nuclear freeze. This was done separately for each version of the nuclear freeze statement. The "strongly disagree" and "disagree" categories were combined into one "disagree" category and the "strongly agree" and "agree" categories were combined into one "agree" category. Differences between means were tested for significance using one-way analysis of variance.

Results

The responses to all 25 belief statements are presented in Table 1. The two different versions of the nuclear freeze proposition appear in statements 8 and 21. The percentage who checked either "strongly agree" or "agree" for statement 8 was 76%, and for statement 21 was 77%. Both of these are close to the 72% of the general public that the CBS News/New York Times poll found

supporting a freeze. Responses to these two different statements of the freeze idea correlated with a Pearson product moment correlation coefficient of +.39, and with a gamma coefficient of +.57. Responses were analyzed by class, and differences were found on only seven of the 25 belief statements. Graduate students were more likely than undergraduate students to agree with statements 1 and 23 and to disagree with statements 9, 10, 11, 12 and 13.

Eight of the 25 items showed a bimodal distribution of responses, with responses grouping not at the center but to either side of the center. These were statements 1, 2, 7, 8, 9, 10, 15 and 17. These bimodal response patterns illustrate the polarization of opinion in the nuclear weapons area.

The factor analysis identified three factors with eigenvalues greater than 1.0, and, which taken together, accounted for 76.7 percent of the variance (see Table 2). Loadings of the 18 belief statements on the total set of six factors are shown in Table 3. Statements having high loadings on Factor 1 were numbers 4, 17 and 18. These statements deal with the belief that it is important to have a strong national defense, and Factor 1 was given the name "Defense." Statements having high loadings on Factor 2 were numbers 1, 5, 7, 10 and 15. These statements deal with the belief that it would be possible to survive a nuclear war, and Factor 2 was given the name "Survival." Statements having high loadings on Factor 3 were numbers 3, 19 and 25. These statements deal with the belief that nuclear war is imminent, and Factor 3 was

given the name "Imminence."

A factor analysis using an oblique rotational method identified essentially the same three factors, indicating that the factors are not highly intercorrelated and showing that the factor solution has some robustness.

The analyses of variance for the first form of the freeze statement showed persons taking different positions on the freeze differed significantly on the Defense factor but not on the Survival or Imminence factors. The means showed a tendency for supporters of the freeze to disagree with the belief that a strong national defense is necessary, but not to differ from opponents in their belief that humanity can survive a nuclear war or their belief that nuclear war is imminent.

The analyses of variance for the second form of the freeze statement showed persons taking different positions on the freeze differed significantly on the Survival factor, but not on the Defense factor or the Imminence factor. The means showed a tendency for supporters of the freeze to disagree with the belief that humanity can survive a nuclear war, but not to differ from opponents in their belief that a strong defense is necessary, or the belief that nuclear war is imminent.

The discovery of three dimensions made it possible to construct a three-dimensional model representing people's beliefs about nuclear weapons and national defense. Mean factor scores were used to locate the supporters and opponents of various policies in this three-dimensional space. This was done by

grouping respondents who agreed and strongly agreed with a statement as supporters, grouping respondents who disagreed and strongly disagreed as opponents, and excluding respondents who marked the neutral response. The three-dimensional model is presented in Figure 1. This method of presenting a three-dimensional model in a two-dimensional diagram was developed by Osgood, Suci and Tannenbaum (1957, p. 114).

The model shows the locations in three-dimensional space of supporters and opponents of the seven specific policy statements included in the questionnaire. These statements had been previously excluded from the factor analysis, so they did not contribute to the factor structure.

The model shows two distinct clusters of points. One group, toward the lower-left-front, is made up of positions in favor of a strong defense, tending to believe in survival of a nuclear war and tending to feel that nuclear war is not imminent. The other group, toward the upper-right-back, is made up of positions less in favor of a strong defense, tending not to believe in survival of a nuclear war and tending to feel that nuclear war is imminent.

The model indicates that positions do not differ as much on the Imminence dimension as they do on the Defense and Survival dimensions. This was also indicated by analyses of variance for all seven specific policy statements, none of which showed a significant relationship to Imminence scores.

The most extreme point in the upper-right-back region is number 9, which identifies a position of supporting unilateral disarmament. The most extreme point in the lower-left-front

region is number 5, which identifies a position of support for waiting for a nuclear freeze until the United States has caught up with the Soviet Union in nuclear weapons. The points numbered 3 and 7 represent the two positions in favor of a nuclear freeze. They are the closest to the origin of the positions in their region, indicating that they are less extreme than some other policies.

Summary and Conclusions

This study has found evidence that three dimensions of beliefs are important in the debate over nuclear weapons and national defense -- a Defense dimension, which relates to whether or not a strong national defense is necessary; a Survival dimension, which relates to whether or not humanity can survive a nuclear war; and an Imminence dimension, which relates to whether or not a nuclear war is imminent.

In contrast to studies of other areas of controversy, such as nuclear power or military policy options in the Korean War, this study did not find that one dimension was important to supporters and another was important to opponents. This would have been indicated if one group had a near zero mean factor score on one dimension, while the opposing group had a significantly different positive or negative mean factor score. Rather, in the area of nuclear weapons policies, the common pattern was for supporters to have a mean score in one direction and opponents to have a mean score in the other direction.

The finding that belief in the imminence of nuclear war was not related to support for either nuclear freeze statement raises

some questions about the usefulness of the argument that nuclear war is imminent. The imminence of nuclear war has been a popular theme for some anti-nuclear weapons speakers, including Dr. Helen Caldicott, the president of Physicians for Social Responsibility. Dr. Caldicott often stresses such messages as "The world is moving rapidly toward the final medical epidemic," "Time is short," and "We are at the crossroads of time" (Caldicott, 1981, pp. 1,3). Critics have said she relies too much on the use of emotional appeals (Ricks, 1982).

The present study suggests that Dr. Caldicott's critics may be correct. If supporters and opponents of the nuclear freeze do not differ in their belief that nuclear war is imminent, there may not be much point in attempting to persuade people that it is. The message that nuclear war is imminent may be too strong a threat, and may suffer the disadvantages of strong fear appeals as persuasive devices (see Janis and Feshbach, 1953).

The three-dimensional model of beliefs about nuclear weapons also supports this advice that imminence of nuclear war may not be the best theme to stress. Most points in the model, whether they represented positions for or against changes in nuclear weapons policies, tended to be close to neutral on the Imminence dimension.

The model indicates that the dimension that most strongly separates supporters and opponents of various nuclear weapons policies is the dimension of belief in a strong defense. This was also the factor that explained the most variance in the factor analysis. These findings suggest that defense may be the overriding

issue in the nuclear debate. As further evidence for this point, when liberal publications such as The New Republic express disagreement with the nuclear freeze position, it is often on the grounds that the freeze doesn't provide realistically for our national defense.

The model also suggests that the nuclear freeze idea, identified by points 3 and 7, may be located at a strategically favorable position. Of the various policies in the same region, the freeze positions are the ones closest to the diagonally opposite region. The freeze positions are not as extreme as some other anti-nuclear positions, and this may account for part of their acceptance.

This study has developed a three-dimensional structure for beliefs in the area of nuclear weapons and national defense and has provided some evidence for its validity by showing that supporters and opponents of various policies occupy significantly different positions on at least two of these dimensions. This three-dimensional structure could be useful in analyzing communications from both sides of the nuclear debate, as well as in the planning of additional communication strategies by either side.

Table 1

Percentages Giving Various Responses to Belief Statements Concerning Nuclear Weapons and Defense

(sa=strongly agree, a=agree, n=neutral, d=disagree, sd=strongly disagree)

	sa	a	n	d	sd
1. The United States and the Soviet Union can both destroy each other, and there is nothing either one can do about it once a nuclear war starts.	20	43	8	27	3
2. If nations have nuclear weapons, sooner or later they will be used.	6	45	19	30	1
3. The world is moving rapidly toward thermonuclear war.	4	32	36	28	0
4. We need a strong national defense system to protect our property and loved ones.	16	52	15	15	1
5. After a major nuclear war, the living would envy the dead.	26	30	24	15	5
6. The United States should reduce its nuclear arsenal by five percent and challenge Russia to do the same.	21	23	28	24	5
7. A limited nuclear war could take place without expanding into a nuclear war of global magnitude.	1	28	8	45	19
8. There should be a halt to any further production, testing and development of nuclear weapons and new delivery systems by the United States and the Soviet Union.	31	45	10	13	1
9. A nuclear freeze should not take place until we have caught up with the Soviet Union in nuclear weapons.	7	18	13	46	16
10. Through adequate preparation, we can be prepared to survive an all-out nuclear attack.	1	16	13	45	26
11. The Soviet Union has ambitions to take over the world.	9	32	30	29	1
12. Supporters of the nuclear freeze are traitors who are selling out to Russia.	1	0	4	55	40

Table 1
(continued)

		sa	a	n	d	sd
13.	The Soviet Union has a definite margin of superiority over the United States in nuclear weapons.	4	24	34	32	6
14.	Nuclear weapons are the only genuine deterrent to a Soviet invasion of Europe.	2	12	20	52	14
15.	A nuclear war would wipe out the human race.	15	38	18	28	1
16.	The Soviet Union has enough nuclear weapons to destroy the United States in a first strike to which we could not retaliate.	1	15	35	44	6
17.	Our nuclear weapons are necessary to keep the Soviet Union from using theirs.	7	57	12	20	5
18.	We have to keep a strong defense so we will have some bargaining power with the Russians.	16	58	14	13	0
19.	If the Soviet Union launched a nuclear attack on the United States, even cities of only ten thousand are likely to be attacked.	3	26	36	31	5
20.	It is unlikely that nuclear weapons will be used in war since 36 years have passed without them being used that way.	0	5	9	69	17
21.	The president of the United States should propose to the Soviet Union that together, and at the same time, both the USA and the USSR freeze the arms race.	36	41	16	6	1
22.	The United States should reduce its arsenal of nuclear weapons even if the Soviet Union doesn't.	5	13	15	50	17
23.	The United States should announce a policy of "No First Use" of nuclear weapons.	14	35	26	21	5
24.	The United States should de-escalate the arms race by beginning unilateral arms reductions right away.	7	31	31	29	3
25.	The world stands on the brink of nuclear annihilation.	4	16	30	46	5

Table 2

Eigenvalues and Percentages of Variance Explained for Six Factors

Factor	Eigenvalue	Percentage Of Variance	Cumulative Percentage
1	2.98487	36.0	36.0
2	2.01538	24.3	60.3
3	1.36561	16.5	76.7
4	.82400	9.9	86.7
5	.67475	8.1	94.8
6	.43128	5.2	100.0

Table 3

Factor Loadings for 18 Belief Statements*

Statement Number	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
1	-.02661	.45220	.05416	.34366	-.16962	.11618
2	-.20275	-.07450	.10185	.64628	-.10672	.07784
3	-.07946	.09846	.50881	.40652	-.08549	-.08690
4	.77394	-.13905	-.17311	-.02768	.29229	.12627
5	.06511	.58152	.16111	-.09689	-.09000	-.09662
7	.17313	-.52639	-.13923	-.14085	-.10615	.00723
10	.04897	-.67257	.10625	.09037	.28706	-.00421
11	.28896	-.10332	.25390	-.14468	.07387	.06264
12	.14575	-.06377	.15046	-.00983	.69145	.28958
13	.12556	-.16501	-.01010	-.01173	.49926	-.03671
14	.27925	.03531	.04973	-.05500	.15945	.68608
15	.01959	.57742	.37240	.06910	-.06535	-.05583
16	.13965	.07449	.08554	.56225	.14543	-.16001
17	.70267	.01436	-.09335	-.02664	.05670	.11384
18	.90719	.01536	.03431	.00760	.04515	.02524
19	-.00740	.13024	.51293	-.00244	.03146	.01028
20	-.00072	-.25416	-.34027	-.02955	.00176	.35292
25	-.12224	.11939	.57939	.22945	.12241	.02508

*Loadings with values greater than .40 are underlined.

Table 4

Mean Factor Scores on Three Factors for Respondents With Varying Degrees of Support For First Statement of the Nuclear Freeze ("There should be a halt to any further production, testing and development of nuclear weapons and new delivery systems by the United States and the Soviet Union.")

	Position on the Freeze Statement				
	Strongly Agree and Agree (N=85)	Neutral (N=11)	Strongly Disagree and Disagree (N=16)	F	Signif
Mean Score on Defense Factor	.1677	-.6798	-.4235	6.510	.002
Mean Score on Survival Factor	-.0621	.1792	.2066	.935	n.s.
Mean Score on Imminence Factor	.0031	-.0330	.0062	.010	n.s.

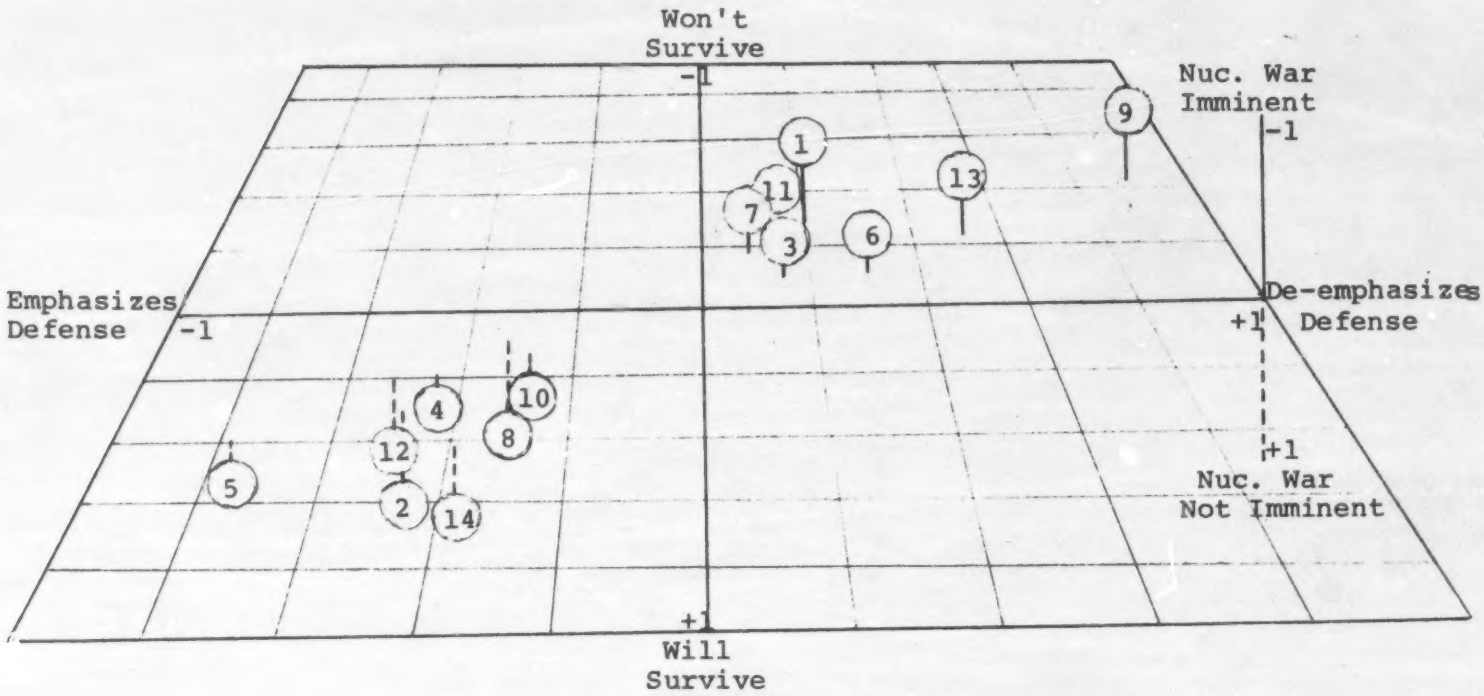
Table 5

Mean Factor Scores on Three Factors for Respondents With Varying Degrees of Support For Second Statement of the Nuclear Freeze ("The president of the United States should propose to the Soviet Union that together, and at the same time, both the U.S.A. and U.S.S.R. freeze the arms race.")

	Position on the Freeze Statement				
	Strongly Agree and Agree (N=86)	Neutral (N=18)	Strongly Disagree and Disagree (N=8)	F	Signif
Mean Score on Defense Factor	.0720	-.1944	-.3368	1.168	n.s.
Mean Score on Survival Factor	-.1017	.4462	.0972	3.205	.05
Mean Score on Imminence Factor	-.0152	-.0271	.2242	.340	n.s.

Figure 1

Locations of Various Response Groups in Three-Dimensional Space Representing Beliefs About Nuclear Weapons



Key

1. Supporters of 5% cut
2. Opponents of 5% cut
3. Supporters of freeze (statement 8)
4. Opponents of freeze (statement 8)
5. Supporters of waiting for freeze
6. Opponents of waiting for freeze
7. Supporters of freeze (statement 21)
8. Opponents of freeze (statement 21)
9. Supporters of unilateral disarmament (statement 22)
10. Opponents of unilateral disarmament (statement 22)
11. Supporters of "no first use" by US
12. Opponents of "no first use" by US
13. Supporters of unilateral disarmament (statement 24)
14. Opponents of unilateral disarmament (statement 24)

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